

5 WHAT IS CLAIMED IS:

1. A high intensity discharge (HID) driver for a HID lamp, comprising:
 - an input processor connected to an input power for suppressing a transient and an in-rush current of the input power;
 - a main driver connected to the input processor and a HID lamp for driving and
 - 10 amplifying the input power; and
 - a protection circuit connected to the main driver and the HID lamp for controlling a timing of starting after a failure condition.
2. The HID driver of claim 1, wherein the HID driver comprises a HID ballast.
3. The HID driver of claim 1, wherein the HID lamp comprises a high pressure
- 15 sodium (HPS) lamp or a metal halide lamp (HML).
4. The HID driver of claim 1, wherein the input power is an alternating current (AC) voltage in a range of about 85V to about 305V at 50HZ/60Hz.
5. The HID driver of claim 1, wherein the HID driver further comprises:
 - a timing circuit connected to the main driver for controlling a timing; and
 - 20 a starting circuit connected to the timing circuit and the HID lamp for starting the HID lamp.
6. The HID driver of claim 5, wherein the HID driver comprises a HID ballast.
7. The HID driver of claim 5, wherein the HID lamp comprises a high pressure sodium (HPS) lamp or a metal halide lamp (HML).
- 25 8. The HID driver of claim 5, wherein the input power is an alternating current (AC) voltage in a range of about 85V to about 305V at 50HZ/60Hz.
9. The HID driver of claim 5, wherein the input power is an AC voltage in a range of about 85V to about 1KV at 50HZ/60Hz.

5 10. The HID driver of claim 5, wherein the input processor further comprises an rectifier and filter circuit.

 11. The HID driver of claim 5, wherein the input processor further comprises an electromagnetic wave controller (EMC) for suppressing an electromagnetic wave interference.

10 12. The HID driver of claim 5, wherein the input processor further comprises a negative temperature control (NTC) resistor for suppressing the in-rush current.

 13. The HID driver of claim 5, wherein the input processor further comprises a voltage sensitive resistor (RV) for suppressing the in-rush current.

 14. The HID driver of claim 5, wherein the rectifier and filter circuit comprises
15 a diode bridge circuit.

 15. The HID driver of claim 5, wherein the main driver further comprises a power factor correction (PFC) circuit connected to the input processor and the protection circuit.

 16. The HID driver of claim 5, wherein the main driver further comprises a
20 special power supply connected to the input processor, the PFC circuit, the timing circuit and the protection circuit.

 17. The HID driver of claim 16, wherein the special power supply comprises at least two circuit paths for supplying power.

 18. The HID driver of claim 5, wherein the main driver further comprises a
25 power driver connected to the input processor, the special power supply, the PFC circuit and the protection circuit.

5 19. The HID driver of claim 18, wherein the power driver further comprises a light adjuster for adjusting the brightness of the HID lamp by adjusting a frequency of the power driver.

 20. The HID driver of claim 5, wherein the main driver further comprises a half bridge inverter connected to the input processor and the HID lamp.

10 21. The HID driver of claim 5, wherein the main driver further comprises a half bridge inverter connected to the input processor and the HID lamp.

 22. The HID driver of claim 5, wherein the main driver further comprises a feedback control circuit connected to the PFC circuit, the power drive and the half bridge inverter.

15 23. The HID driver of claim 5, wherein the starting circuit comprises a sub-starting circuit having a SIDAC connected in series to a diode and an inductor for starting the HID lamp quickly and reliably.

 24. The HID driver of claim 23, wherein the starting circuit comprises a capacitor connected in parallel to the HID lamp in replacement of the sub-starting
20 circuit when the HID lamp is a metal halide lamp (HML).

 25. The HID driver of claim 5, wherein the starting circuit comprises a circuit having a capacitor for fine tuning an output of the HID lamp, a brightness of the HID lamp, and a low-frequency content for controlling an induced sound resonance.

 26. The HID driver of claim 5, wherein the starting circuit comprises a circuit
25 having a thyristor between a capacitor and a resistance for preventing the HID drive from restarting when the HID lamp is on.

 27. The HID driver of claim 26, wherein the thyristor is connected to the timing circuit to control a re-starting of the HID lamp by the timing circuit.

5 28. The HID driver of claim 5, wherein the main driver comprises a first
integrated circuit (IC) for PFC and for governing preceding filtering and rectification
and a second IC for power driving and the timing circuit comprises a third IC, and when
input voltages of the first, second and third ICs are below predetermined values, the
second and the third ICs are locked out and the first IC is maintained to be powered and
10 ready for a re-starting.